October 2, 2012

California Energy Commission
Dockets Office, MS-4
Re: Docket No. 12-EPIC-01
1516 Ninth Street
Sacramento, CA 95814-5512
Sent electronically to: docket@energy.state.ca.us

Re: California Energy Commission Docket No. 12-EPIC-01
Workshop Re: The Electric Program Investment Charge Proposed 2012-2014 Triennial Investment Plan

To the California Energy Commission:

The Nature Conservancy, Natural Resources Defense Council, and Union of Concerned Scientists strongly support the Electric Program Investment Charge ("EPIC") Proposed 2012-2014 Triennial Investment Plan ("Plan") and commend the Commission and its staff for its hard work drafting it. The Plan will provide comprehensive guidance to the Commission as it implements the EPIC program. Recognizing there are a significant number of funding needs and initiatives, we urge adoption of the Plan and offer comments on a few strategic initiatives. We also provide general comments on the program and its administration.

I. Applied Research and Development

1. S5: Reduce the environmental and public health impacts of electricity generation and make the electricity system less vulnerable to climate impacts.

We strongly support the draft Plan's dedication of resources to better understand how our changing climate and related extreme weather events pose threats to the state's evolving electricity system and how those impacts will affect public health and the environment. This information is vital to inform decisions for how we adapt to those climate impacts that are already occurring and plan for the future.

As the draft Plan notes, California leads the nation on climate change research. As the state continues its efforts to meet its energy goals and its emissions mandate, continuation of this research function is paramount. The state will not succeed without it. In addition, federal funding for climate monitoring and research has become politicized and subsequently reduced, increasing the need for California's research to continue. And as the Plan notes, the need for

continued research with a focus on California and the West is critical given that even when fully funded, national research efforts cannot adequately address the unique challenges that climate change presents to the state.

Recent research has demonstrated that California's electricity system is vulnerable to climate change and extreme events. The Special Report on "Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation" released by the Intergovernmental Panel on Climate Change earlier this year,[1] suggested that climate change has already led to extremes such as heat waves and record high temperatures, and these extremes are expected to worsen. Last December, Governor Brown convened decision makers to discuss the threats posed by extreme climate risks to California's economy and communities. Material from the "Extreme Climate Risks and California's Future" conference stated:

> California's peak energy demand tends to occur on hot summer afternoons, and an increase in heat waves will exacerbate this growth in peak demand. Adding peak generating capability necessary to supply this increased demand is expensive and could result in electricity cost increases. Very hot weather also can stress California's energy grid that delivers electricity to consumers and increase vulnerability to power outages. Projections also suggest that climate change will drive up demand for air-conditioning, leading to increases in electricity use of 55% by 2100 and costs of $35 billion.[2]

Given the direct connection between climate change and the state's energy system, the state's greenhouse gas reduction goals, and the mandate to balance these goals with appropriate levels of environmental protection, the strategic objective S5 is critical.[3] The Plan recognizes that the environmental costs and benefits of renewable energy policies must be understood by decision makers in order to balance environmental protection with energy development. Currently, there is a lack of information in this area and strategic initiatives 5.1-5.4 will fill that knowledge gap.

5.1 Air quality research to address environmental and public health effects of conventional and renewable energy and to facilitate renewable energy development

This initiative is essential to inform our understanding of how renewable energy generation and new natural gas power plants will function over time as the climate changes and effect air quality and human well-being. Additionally, focused research is especially important to assess pollution exposure and public health effects in disadvantaged communities. We strongly support the adoption of this funding strategy and encourage its application to existing fossil fuel generation as well.

5.2 Research on sensitive species and habitats to inform renewable energy planning and deployment

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[1] IPCC, 2012: Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change [Field, C.B., V. Barros, T.F. Stocker, D. Qin, D.J. Dokken, K.L. Ebi, M.D. Mastrandrea, K.J. Mach, G.-K. Plattner, S.K. Allen, M. Tignor, and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, UK, and New York, NY, USA, 582 pp.

[2] "Extreme Climate Risks and California's Future" conference material: http://gov.ca.gov/docs/Conference_overview_and_FAQs.pdf

[3] (Plan, Chapter 3, p. 69)

We agree that baseline data, tools, and methodologies to assess and mitigate the interactions of species and their habitats with renewable energy are extremely important when siting new renewable energy projects. Important research has been conducted on the state's biological resources, but applied research on the environmental effects of electricity generation is lacking. EPIC funded research in this area will help avoid unnecessary damage to California's vulnerable species and habitat, while reducing delay and uncertainty in the siting process for new facilities. We support this initiative, as well as other research that informs the Desert Renewable Energy Conservation Plan, and are pleased to see it will also address research on fossil fuel generation.

5.3 Analytical tools and technologies to reduce energy stresses on aquatic resources water and improve water-energy management

Climate, energy, water, and aquatic species are all interrelated and understanding these relationships will be especially critical in the coming years as climate changes alters California's water system. We encourage the adoption and prioritization of research on reducing energy stresses to water, aquatic resources, and inland and coastal fish, including salmon. We are also pleased to see that high elevation hydropower will be addressed in this initiative as well in 5.4.

5.4 Analytical tools and technologies to plan for and minimize the impacts of climate change on the electricity system

We strongly encourage the adoption and prioritization of initiative 5.4 to "develop analytical tools and technologies to plan for and minimize the impacts of climate change on the electricity system." California's Public Interest Energy Research ("PIER") program research has been critical to addressing issues related to the demand, supply, transmission and reliability of power, as well as cost containment and general well-being of ratepayers. Understanding these characteristics of the energy system is critical to helping the state develop policies that provide ratepayer protections, effective alternatives, adaptive management, and a safe and reliable energy system. To this end, EPIC research funds should focus on the barriers and basic conditions that influence siting, energy consumption, generation and demand patterns, local/state/federal permit conditions, generation location and capacity, and power interruption and stability.

In light of the increasing frequency of climate magnified extreme events, funding future research on impacts of climate change to California's energy system is critical, in part, to ensure reliable and affordable electricity for California ratepayers. PIER research has provided this essential research in past. The CEC workshop, "The California Energy System Prepares for Climate Change," held on April 30, 2012, highlighted a number of PIER-funded studies that demonstrated that climate change is affecting, and will have even greater effect on, the state's energy system. The Third Assessment from the California Climate Change Center, "Our Changing Climate 2012," described the threats posed to California's energy system from climate change such as increased energy demand, increased vulnerability of hydropower facilities, and electricity transmission corridors.[4] This information, together with information about socio-

[4] See:

- Rheinheimer, D. R., S. T. Ligare, and J. H. Viers (Center for Watershed Sciences, University of California, Davis). 2012. Water-Energy Sector Vulnerability to Climate Warming in the Sierra Nevada: Simulating the Regulated Rivers of California's West Slope Sierra Nevada. California Energy Commission. Publication number: CEC-500-2012-016.
- Guegan M., K. Madani, and C. B. Uvo. 2012.Climate Change Effects on the High-Elevation Hydropower System with Consideration of Warming Impacts on Electricity Demand and Pricing. California Energy Commission. Publication number: CEC-500-2012-020.

economic status, is being analyzed to find options to reduce impacts on disadvantaged communities, the elderly, and other sensitive ratepayers. It is critical to utilities as they plan for system reliability and to local jurisdictions to minimize impacts of extreme heat on ratepayers.

The Plan states that the evolution of our energy system should be guided with "information that facilitates the creation of a more climate-resilient energy system." Specifically, the Plan proposes to:

1. Improve climate projections for California;
2. Improve the depiction of high elevation hydropower units in water models under climate scenarios;
3. Address the energy implications adaptation measures; and
4. Research potential evolution of the energy system to identify how the energy system will need to change to drastically reduce GHG emissions while avoiding or minimizing environmental impacts.

We support these goals and agree that it is unlikely that programs other than EPIC would be able to generate this critical scientific and engineering research. Given the emerging, climate-driven threats to California's energy system, the state must continue to fund scientific research to analyze the impacts of California's energy generation and consumption on its environment and ratepayers. We therefore urge the Commission to adopt Strategy 5.4.

2. Enhancing the environmental performance of bioenergy conversation to electricity

We generally support the recommendation to invest in developing and demonstrating innovative and sustainable bioenergy technologies and deployment systems (S3.2 and S12.1). We agree that bioenergy offers the potential for increasing the supply of clean local renewable energy and economic development. However, in order to achieve these potential benefits, bioenergy development must be environmentally sustainable. Unless dealt with effectively, public health and environmental impacts will continue to pose a significant obstacle to widespread deployment.

The EPIC bioenergy applied research initiatives in the Plan encompass research on reducing the environmental impacts of bioenergy technologies, including harvest, processing, conversion, and transportation.[5] We strongly support these components of the bioenergy research initiative and urge staff to ensure they are included in the final investment plan.

3. Support for electric vehicle-related grid investments

We strongly support the proposal to fund research into expansion of electric vehicle infrastructure. These include the lifecycle of batteries, the potential for "second life" storage applications, research into charging technologies and approaches to integrate plug-in electric vehicles into the grid, and research into the potential for vehicle to grid storage.

- Auffhammer, Maximilian and Anin Aroonruengsawat (California Climate Change Center). 2012. Hotspots of Climate-Driven Increases in Residential Electricity Demand: A Simulation Exercise Based on Household Level Billing Data for California. California Energy Commission. Publication number: CEC-500-2012-021.

[5] pp. 55-56

4. Development of models and simulation beyond 33% RPS

Finally, we strongly support using EPIC research funds to develop and refine tools, models, and simulations to enhance our energy planning to meet our 2050 emission reduction goals. Given the time it takes to develop specific policies, as well as clean and environmentally benign infrastructure and generation resources, we encourage the Commission to look beyond the 2020 horizon and prepare for an energy grid that can support higher levels of renewables far beyond our current 33% mandate, as well as much higher overall electricity generation needs to accommodate the widespread electrification of our vehicle fleet.

II. Technology Demonstration and Deployment

We strongly support the use of EPIC funds for technology demonstration and deployment. We believe that using funds to help clean technologies prove themselves at a commercial scale will address a critical funding gap and bring these technologies closer to market. We also urge the Commission to focus on defining current operational challenges and deficits, rather than choosing technology winners at the outset to accomplish specific strategic initiatives in the draft plan.

1. Enhancing the environmental performance of bioenergy

We support the draft Plan's proposal to fund emission control technologies to ensure bioenergy production meets local air quality standards. New fuel handling systems or technologies that reduce the transportation costs of biomass feedstocks should also address the air quality impacts of the transportation.

2. 20% earmark for bioenergy

We continue to support setting aside 20% of the technology demonstration and deployment funds for bioenergy in the 2012-2014 investment cycle, but remind the Commission that D.12-05-037 allows this earmark to be reexamined in future investment plans.

III. Other Comments

1. Program administration

Stakeholder engagement and advisory group
In order to be successful, the EPIC program needs to have an open, two-way flow of information to critical stakeholders. EPIC needs to be connected to stakeholders so EPIC staff and programs can stay current with fast-moving developments in technology and policy and so businesses and policy makers are kept informed of the results of EPIC-funded research.

The Plan notes the importance of regular consultation with stakeholders and proposes to hold a minimum of twice yearly public forums to exchange information. We agree with this direction and note our appreciation for the stakeholder workshops that were held this past August. The Plan also identifies the possibility of creating advisory groups to provide an additional forum for information exchange.[6]

We support the creation of an advisory committee composed of key stakeholders. As we envision it, the advisory committee would be composed of approximately 15-25 key stakeholders, including, but not limited to, the legislature, sister agencies, utilities, researchers, industry associations, consumer and environmental groups, and other key stakeholders. The advisory committee would meet at least two to three times a year and have open, frank discussions on key issues facing the EPIC program, including strategy, coordination with outside agencies and programs, and other issues as needed.

As the title indicates, the advisory committee would not be a decision-making body. All final decisions would be vetted through the formal Commission stakeholder process. Instead, the principal goal would be to facilitate the two-way flow of information that is critical to the success of the EPIC program. In our experience, a well-managed advisory committee composed of key stakeholders provided valuable support to the PIER program in the past. We believe that it can be a key component of a establishing a successful EPIC program in the future.

Outreach

We also encourage the Commission to communicate the activities funded through the EPIC program to the general public as much as possible. This will enhance the public's understanding and support for California's research and development investments, help avoid funding duplication, and encourage collaboration within the scientific community. We do not believe that the 10% administrative cap should cover outreach efforts, and that outreach efforts should be expanded to include at least one opportunity for the CEC to present the activities currently funded under EPIC in a public forum.

Intellectual Property

We strongly support the Commission ensuring that research geared towards new knowledge, rather than product development, remain in the public domain. Given that this money for research is coming from ratepayers, ratepayers should have access to the knowledge gained as much as possible. Periodic outreach efforts, through public workshops, by the Commission to communicate the activities funded under EPIC is one way to support this.

2. <u>Energy Innovations Small Grants</u>

The PIER program included an innovative funding window called the Energy Innovations Small Grants (EISG) program. This program provided relatively small grants to cutting-edge research projects that were at the proof of concept level. As described in the 2009 PIER annual report, [7] a number of the EISG grants went to fund projects that were able to garner much larger amounts of

[6] p. 165
[7] p.43-45

private capital, and later grew into highly successful businesses that provide millions of dollars in benefits to the state.

The EISG program provided key support to projects that are, in many cases, inappropriate for the larger grants window. By providing grants to these proof-of-concept level projects, the EISG helped these projects emerge from the desktop into investment-worthy projects that could compete for larger EPIC grants as well as private sector funding. We urge EPIC staff to consider establishing a similar small grants window under the EPIC program.

3. Fund-Shifting

The CPUC's decision adopting EPIC[8] allows the Commission to shift a maximum of 5% of program funds from one category to another during each 3-year investment plan cycle, after the initial plan is approved.[9] This was not referenced in the Plan, but we would like to remind the Commission of this flexibility.

Once again, we strongly support this draft Plan and appreciate all the work the Commission has done to produce it. Thank you for the opportunity to submit these comments; we look forward to additional opportunities to engage.

Sincerely,

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[8] D.12-05-037
[9] D.12-05-037, p. 67-68